

## **A Bag**

**[0001]** This application claims the benefit under 35 U.S.C. § 120 to PCT application PCT/SG01/00223, filed on October 19, 2001, entitled "A Bag" and published in English on May 22, 2003 as International Publication No. WO 03/042072, which application is hereby incorporated herein by reference.

### **TECHNICAL FIELD**

**[0002]** The invention relates to a bag, and especially to a bag for an electronics device which is substantially impervious to moisture.

### **BACKGROUND**

**[0003]** Semiconductor devices are conventionally stored and transported in bags that are impervious to moisture. Typically, the bag material includes a metal foil layer which is normally opaque. In addition to the semiconductor device, the bags usually also contain a desiccant to ensure that the air within the bag remains as dry as possible, and a moisture indicator to enable a user to confirm that the moisture within the bag is below a pre-defined level when the bag is opened.

**[0004]** However, one of the problems with this conventional system is that it is necessary to have two additional components (the desiccant and the moisture indicator), which need to be inserted into the bag with the semiconductor device prior to sealing of the bag. In addition, it is not possible to view the moisture indicator without first opening the bag.

## SUMMARY OF THE INVENTION

**[0005]** In accordance with a preferred embodiment of the present invention, there is provided a bag comprising side walls that are substantially impervious to moisture and having an opening at one end which is adapted to be sealed, a portion of a side wall comprising a substantially transparent material which is substantially impervious to moisture and a moisture indicating material mounted within the bag adjacent the transparent material to enable the moisture indicating material to be viewed through the transparent material, and at least a portion of the moisture indicator material being exposed to air within the bag.

**[0006]** Preferably, the side walls of the bag further comprise a desiccant material which defines at least a portion of an inside wall of the bag. Typically, the desiccant material may be a silica gel. Preferably, the side walls of the bag comprise a laminated material which may comprise a metal foil. Preferably, the substantially transparent material may be a transparent moisture barrier film, such as DY3008-NM 260 moisture barrier film manufactured by Dou Yee Enterprises (S) Pte Ltd. Typically, the bag is for containing an electronics device, such as a packaged semiconductor device.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0007] An example of a bag in accordance with the invention will now be described with reference to the accompanying drawings, in which:

[0008] Figure 1 shows a bag for a semiconductor device; and

[0009] Figure 2 is a cross-sectional view along the line AA in Figure 1.

## DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

**[0010]** The making and using of the presently preferred embodiments are discussed in detail below. It should be appreciated, however, that the present invention provides many applicable inventive concepts that can be embodied in a wide variety of specific contexts. The specific embodiments discussed are merely illustrative of specific ways to make and use the invention, and do not limit the scope of the invention.

**[0011]** Figures 1 and 2 show a bag 1. As will be discussed below, the bag includes a moisture indicator strip embedded on the barrier bag. The outer layer is able to prevent moisture from entering and the inner layer has material able to absorb moisture (to replace silica gel.)

**[0012]** The bag 1 is fabricated from two rectangular sheets 3, 4 of flexible material that are joined together by a weld 5 along three edges 20, 21, 22 so that the each sheet 3, 4 defines a side wall of the bag 1.

**[0013]** The sheets 3, 4 each have a respective fourth edge 7, 8 that defines an opening 6 into which a packaged semiconductor device (not shown) may be inserted prior to sealing the opening 6 by sealing together the edges 7, 8, for example by a thermoplastic welding process.

**[0014]** The sheets 3, 4 each include a laminated aluminum foil material 9 on the outside and a layer of a desiccant material 10, such as silica gel, on the inside.

**[0015]** Typically, the desiccant material 10 may be located within a porous inner bag 15 that is attached to the inner wall of the foil material 9, as shown in Figure 2. The sheet 3 includes a window portion 11, which is formed from a substantially transparent material 12 that is also substantially impervious to moisture. For example, a suitable material may be DY3008-NM 260 moisture barrier film produced by Dou Yee Enterprises (S) Pte Ltd. Located adjacent to the

transparent material 12 is a moisture indicating material 13, which is located on the inside of the transparent material 12.

**[0016]** In use, a packaged semiconductor device is placed within the bag 1 and the ends 7, 8 of the sheets 3, 4 are sealed together to seal the semiconductor device within the bag 1. The desiccant 10 on the inside of the side walls 3, 4 absorbs any moisture within the bag 1 after it has been sealed. In addition, after the bag has been sealed, a user can view the moisture indicator 13 through the transparent material 12 to ensure that the moisture within the bag 1 is below a predetermined level. As shown in Figure 1, the moisture indicator 13 may comprise three separate moisture level indicators 16, 17, 18. For example, the indicator 16 may be a first warning that the moisture in the bag 1 is approaching a danger level, the indicator 17 may provide an intermediate warning that indicates to a user to put the semiconductor device into a new bag, and the indicator 18 may provide a warning that the moisture levels have exceeded the recommended maximum level and that the electronic device within the bag should be inspected before use.

**[0017]** While this invention has been described with reference to illustrative embodiments, this description is not intended to be construed in a limiting sense. Various modifications and combinations of the illustrative embodiments, as well as other embodiments of the invention, will be apparent to persons skilled in the art upon reference to the description. It is therefore intended that the appended claims encompass any such modifications or embodiments.